What is claimed is:

1. An arrangement for the stabilization of the radiation emission of a plasma, particularly for generating extreme ultraviolet radiation, comprising:

a bundled energy beam which is directed to a target which is formed as a target jet and which has a flow direction oriented substantially orthogonal to the radiating direction of the energy beam;

measuring devices being provided for successive detection over time of deviations of at least one of the directions of the target jet or the energy beam from an intersection point of the two directions that is provided as an interaction point;

said measuring devices having output signals which are suitable as regulating variables for the orientation of the directions on the interaction point; and

actuating elements being provided for adjusting and tracking at least one of the directions of the target jet and energy beam depending on the output signal of the measuring devices in the manner of a control loop.

2. The arrangement according to claim 1, wherein measuring devices are provided for detecting deviations of the directions at the interaction point in a dimension which is oriented orthogonal to the directions of the target jet and the energy beam, the measuring devices being arranged substantially in the direction of the axis of the energy beam.

3. The arrangement according to claim 2, wherein a measuring device is provided in said dimension for acquiring the position of the target jet, wherein a spatially resolving sensor is arranged in a normal plane to the axis of the energy beam.

4. The arrangement according to claim 3, wherein the spatially resolving sensor is an optical sensor which is so arranged in relation to a light source for illuminating the target jet that a characteristic intensity pattern of the target jet is imaged on its receiver plane.

5. The arrangement according to claim 4, wherein the sensor is a photodiode with a wedge-shaped receiver area, wherein a linear change in the photovoltage representing the output signal is associated with a change in the position of the target jet in said dimension.

6. The arrangement according to claim 4, wherein the sensor is a receiver array, wherein a position of the imaged characteristic intensity pattern that is changed with respect to a neutral position is associated with a change in position of the target jet, and the difference between the changed position and the neutral position represents the output signal, preferably as a centroid difference.

7. The arrangement according to claim 4, wherein the sensor has two receiver areas, wherein a changed differential photovoltage representing the output signal can be detected when there is a change in position of the target jet.

8. The arrangement according to claim 7, wherein the sensor has two receiver areas which are tapered in a wedge-shaped manner relative to one another, wherein a changed differential photovoltage representing the output signal can be detected when the position of the target jet changes.

9. A device according to claim 7, wherein two iteration steps which can be repeated cyclically are provided for calibrating the differential photovoltages relative to the respective target positions.

10. A device according to claim 8, wherein two iteration steps which can be repeated cyclically are provided for calibrating the differential photovoltages relative to the respective target positions.

11. The device according to claim 9, wherein the position of the target jet can be measured in a normal position relative to the energy beam as a first differential photovoltage U_1 in a first step and, after a relative displacement Δx which is carried out in a defined manner by an actuating element, a second differential photovoltage U_2 can be detected, wherein a linear function for generating an output signal of the measuring device which is scaled with respect to the path has the following slope: $a = \Delta x/(U_1 - U_2)$.

12. A device according to claim 1, wherein measuring devices for detecting the

directional deviation of a laser beam as energy beam are provided in two dimensions orthogonal to one another, a spatially resolving sensor being arranged in a normal plane relative to the axis of the laser beam.

13. The device according to claim 12, wherein the spatially resolving sensor is a quadrant detector.

14. The arrangement according to claim 1, wherein actuating elements for tracking the energy beam are provided in order to compensate for changes in position between the target jet and the energy beam, wherein the output signals of the measuring devices are provided as regulating signals for the deflection of the energy beam.

15. The arrangement according to claim 14, wherein a swivelling mirror is arranged in one dimension as an actuating element for the angular deflection of a laser beam used as energy beam, the mirror being swivelling at least around an axis parallel to the flow direction of the target jet.

16. The arrangement according to claim 15, wherein a swivelling mirror is arranged in one dimension as an actuating element for the angular deflection of a laser beam used as energy beam, the mirror being swivelling in addition around an axis orthogonal to the flow direction of the target jet so that the plasma and, therefore, the source location of the radiation can be changed.

17. The arrangement according to claim 14, wherein an electromagnetic deflecting unit is provided as an actuating element for angular deflection of an electron beam used as energy beam, the deflecting unit having at least one deflecting plane orthogonal to the flow direction of the target jet.

18. The arrangement according to claim 2, wherein actuating elements for tracking the target jet are provided in order to compensate for changes in position between the target jet and energy beam, wherein the output signals of the measuring devices are provided as regulating signals for manipulating the position of an exit nozzle of the target jet.

19. The arrangement according to claim 18, wherein the exit nozzle is movable in one dimension within a normal plane of the target jet, this movement being oriented

orthogonal to a plane defined by the target jet and energy beam.

20. The arrangement according to claim 18, wherein the exit nozzle is swivelling orthogonal to the flow direction of the target jet around an axis parallel to the radiating direction of the energy beam.

21. The arrangement according to claim 1, wherein measuring devices for detecting the position of the target jet are provided in two dimensions orthogonal to one another, wherein one spatially resolving sensor is arranged parallel to the axis of the energy beam and another sensor is arranged orthogonal thereto.

22. The arrangement according to claim 21, wherein actuating elements for tracking the target jet are provided in two dimensions in order to compensate for changes in position between the target jet and energy beam, wherein the output signals of the orthogonal spatially resolving sensors are provided as regulating signals for a two-dimensional displacement of an exit nozzle of the target jet.

23. The arrangement according to claim 22, wherein the exit nozzle is movable in two dimensions within a normal plane of the target jet by a micromanipulator.

24. A device according to claim 14, wherein the actuating elements of the target jet and energy beam are provided in combination with the measuring elements and regulating elements to execute a deliberate movement of the plasma along a defined path, wherein, corresponding to the output signals of the measuring elements, the regulating elements provide a time curve to be adjusted for the interaction point as a modified actuating variable for the actuating elements.

25. The arrangement according to claim 1, wherein measuring devices for detecting the position of the target jet in two dimensions orthogonal to the flow direction of the target jet are arranged in such a way that components of the deviation of the target jet orthogonal to the axis of the energy beam and parallel thereto can be measured by means of a spatially resolving sensor.

26. A device according to claim 25, wherein the spatially resolving sensor is arranged at an angle which differs from the parallel or orthogonal direction of the energy

beam by a suitably selected angle wherein the projections on the coordinate directions to be regulated can be determined as output signals.

27. The device according to claim 26, wherein said selected angle is 45°.